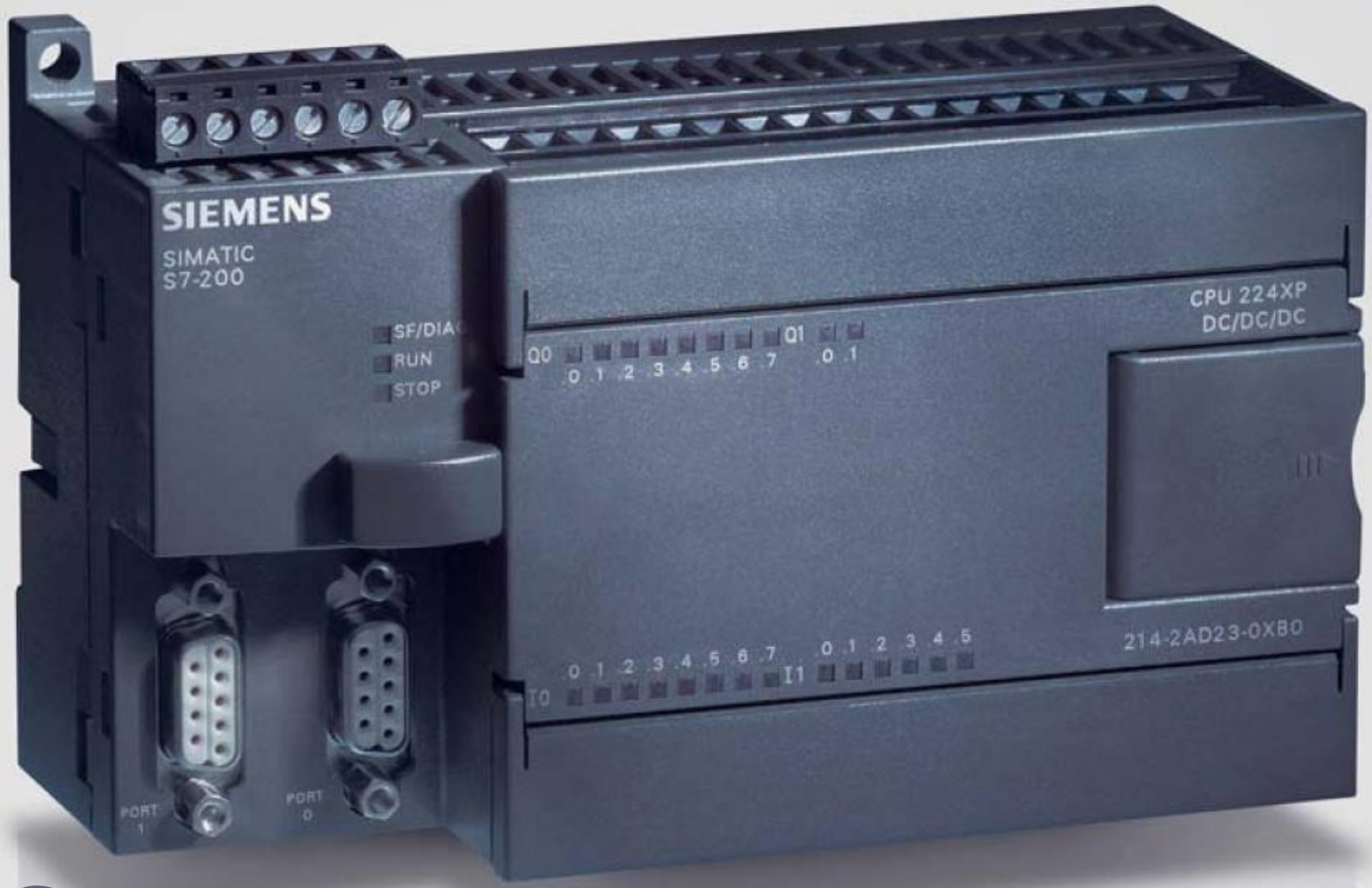
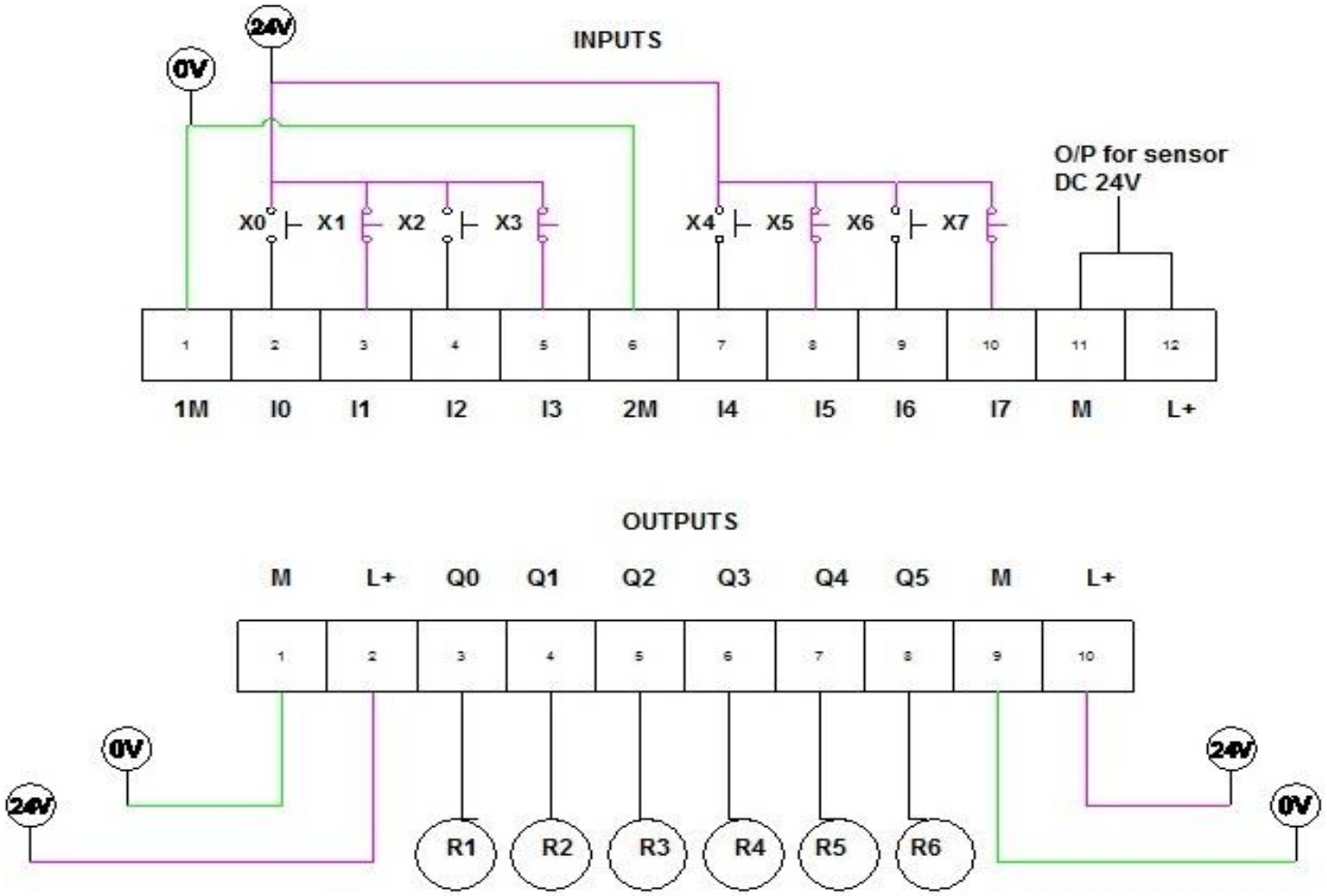


PLC

Siemens S7 200

www.nfiautomation.org

S7 200 PLC Wiring Diagram



PLC Programming Software Step 7

USB PPI Cable for Programming

Works best with Windows XP only

Input/ Output Addressing

Digital Input Addressing (I 0.0 ~ I 15.7)

I 0.0 First Input

I 0.1 Second Input

Digital Output Addressing (Q 0.0 ~ Q 15.7)

Q 0.0 First Output

Q 0.1 Second Output

Analog Input Addressing (AIW0 ~ AIW30)

AIW0 First Input

AIW2 Second Input

Analog Output Addressing (AQW0 ~ AQW30)

AQW0 First Output

AQW2 Second Output

Bit Memory (M)

M 0.0 ~ M31.7

Local Memory (L) - Volatile

LB0 ~ LB63

Variable Memory (V) – Non Volatile

VB0 ~ VB2047

Special Memory (SM)

SM0.0~ SM299.7

Timers, Counters & Other Addressing

Time Base	ON/OFF Timer	Retentive Timer
1 ms	T32, T97	T0, T64
10 ms	T33 ~ T36, T97 ~ T100	T1 ~ T4 T65 ~ T68
100 ms	T37 ~ T63 T101 ~ T255	T5 ~ T31 T69 ~ T95

Elements	Addresses	Elements	Addresses
Counters	C0 C255	Interrupts	0 ~ 127
High Speed Counters	HC0 ~ HC25	Positive/ Negative Transition	256
Sequential Control Relays	S0.0 ~ S31.7	PID Loops	0 ~ 7
Acc. Register	AC0 ~ AC3	Acc. Register	AC0 ~ AC3
Jump/Label	0 ~ 255	Jump/Label	0 ~ 255
Call/ Subroutine	0 ~ 63	Call/ Subroutine	0 ~ 63

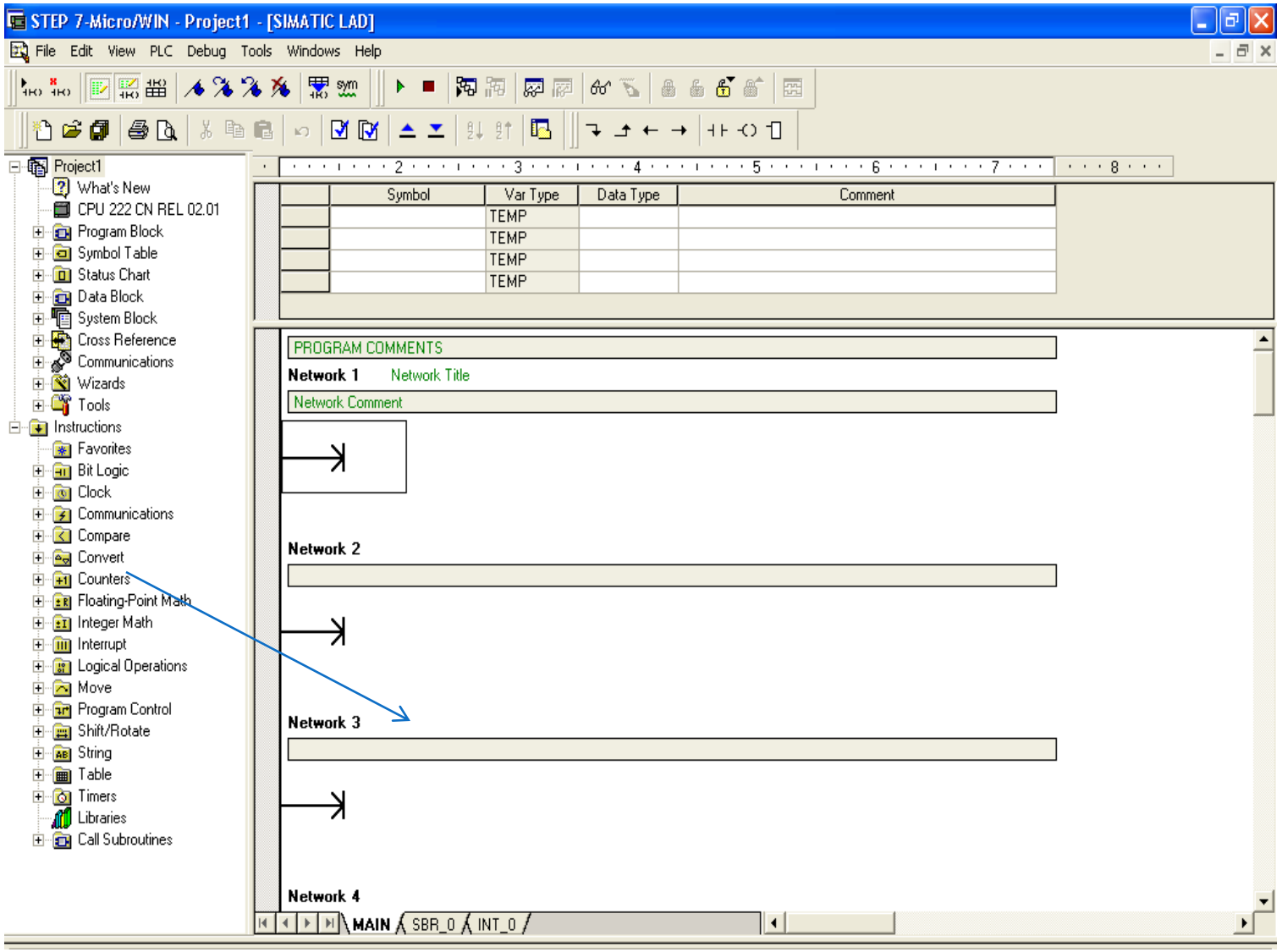
System Status Bits

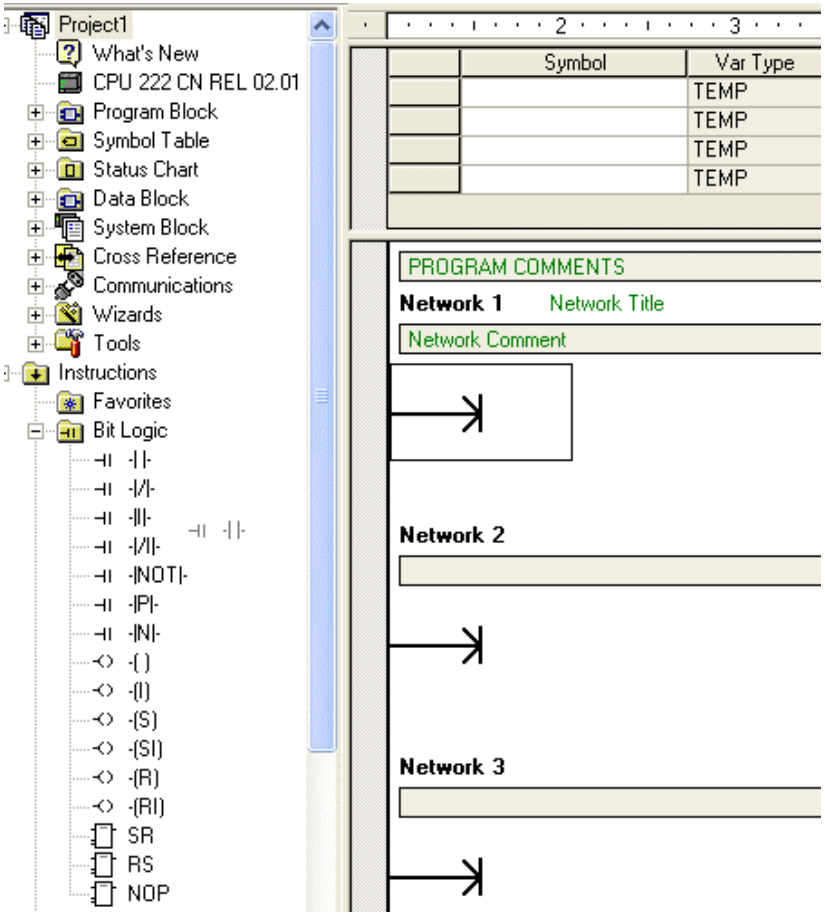
SPECIAL MEMORY BIT	DESCRIPTIONS
SM 0.0	Always ON
SM 0.1	First SCAN ON- On for only one scan cycle
SM 0.3	RUN Power Up – ON for 1 scan cycle when PLC goes to RUN mode
SM 0.4	60s Clock Pulse – ON for 30 seconds & OFF for 30 seconds
SM 0.5	1s Clock Pulse – ON for 0.5 second & OFF for 0.5 second
SM 0.6	Clock Scan – ON for 1st Scan & Off for 2nd Scan & so on…
SM 0.7	Mode Switch – Indicate Current position of Mode Switch OFF = TERM Position ON = RUN Position
SM 4.7	Force ON – Turn ON when any memory location is Forced
SMW22	Word provide SCAN time of Last scan
SMW24	Word provide min. SCAN time recorded since entering RUN Mode
SMW26	Word provide max. SCAN time recorded since entering RUN Mode
SMB28	Pot_0_Value = Stores the value entered with analog adjustment
SMB29	Pot_1_Value = Stores the value entered with analog adjustment

Range of Bits

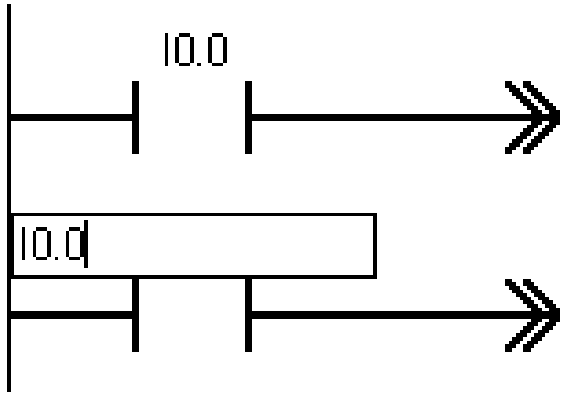
Type	Range (Unsigned)
Byte, B	0 ~ 255; 0 ~ FF
Word, W	0 ~ 65535; 0 ~ FFFF
Double Word, D	0 ~ 4294967295 0 ~ FFFFFFFF

PLC software view

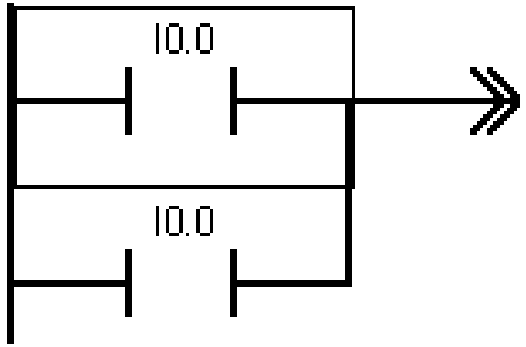




Dragging symbols



Symbols in parallel



Blocks are connected

SIEMENS INSTRUCTIONS

Inputs are written as :

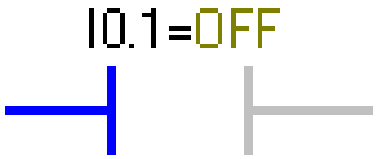
I0.0 - first input, I0.1- second input and so on, for first card.

I1.0 - first input, I1.1 - second input and so on, for 2nd card.

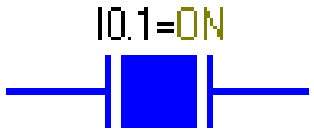
Outputs are written as :

Q0.0 – first output, Q0.1 – second output and so on, for first card.

Q1.0 - first output, Q1.1 - second output and so on, for 2nd card.



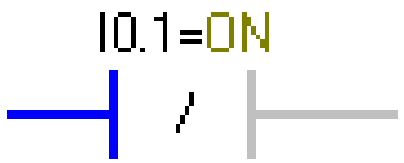
NO, during off state



NO, during on state

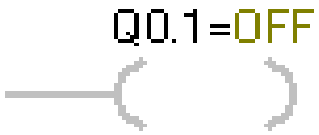
NORMALLY CLOSED CONTACT

NC, during off state

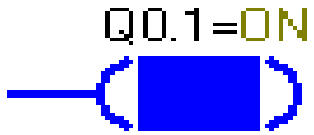


NC, during on state

OUTPUT COIL

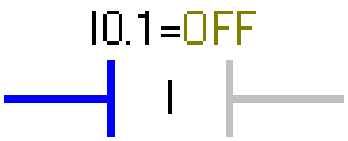


O/P, during off state

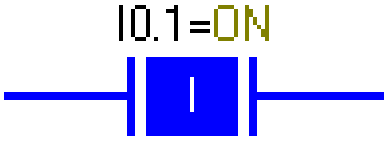


O/P, during on state

- NORMALLY OPEN IMMEDIATE contact:



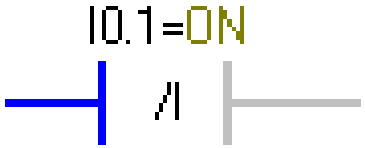
NOI, during off state



NOI, during on state

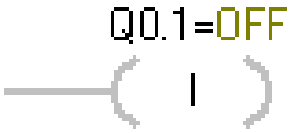
- NORMALLY CLOSED IMMEDIATE contact:

NCI, during off state

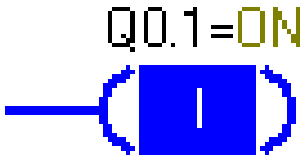


NCI, during on state

- OUTPUT IMMEDIATE:

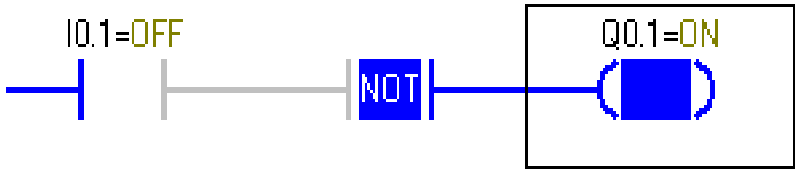


OPI, during off state

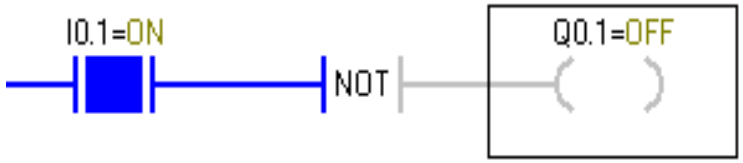


OPI, during on state

- NOT command:

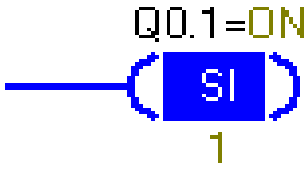


When button is not pressed

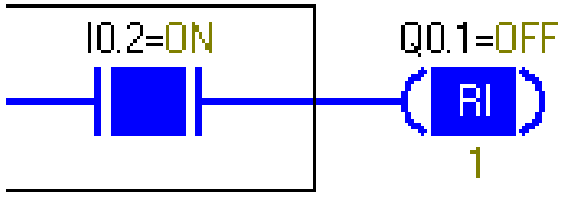


When button is pressed

- SET / RESET immediate:

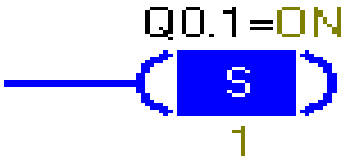


SI, during on state



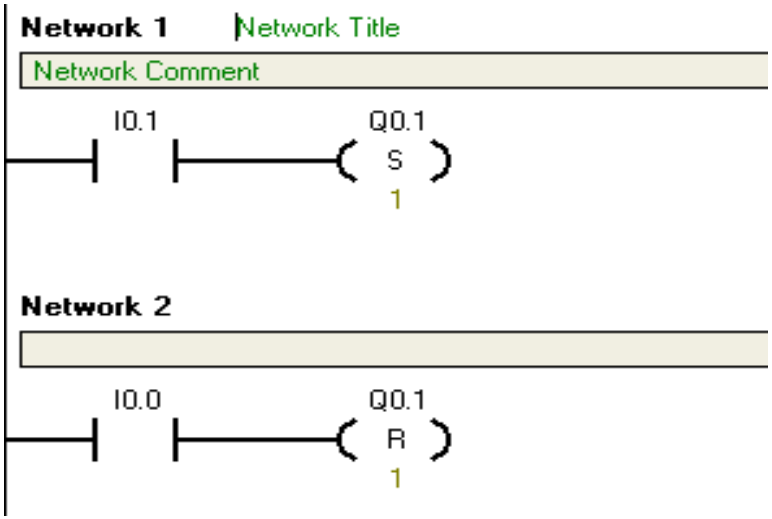
RI, when button is pressed

SET Command:

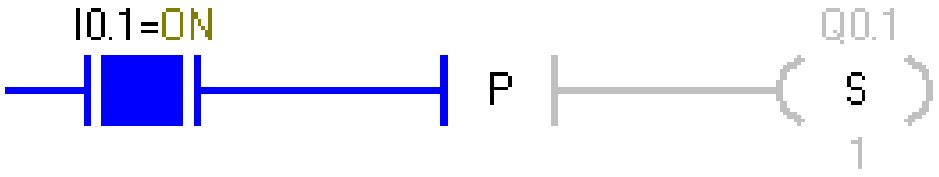


Set during active state

- RESET command

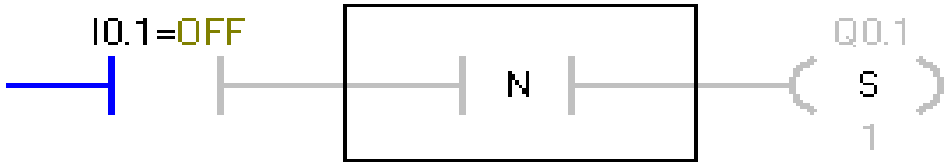


POSITIVE transition:



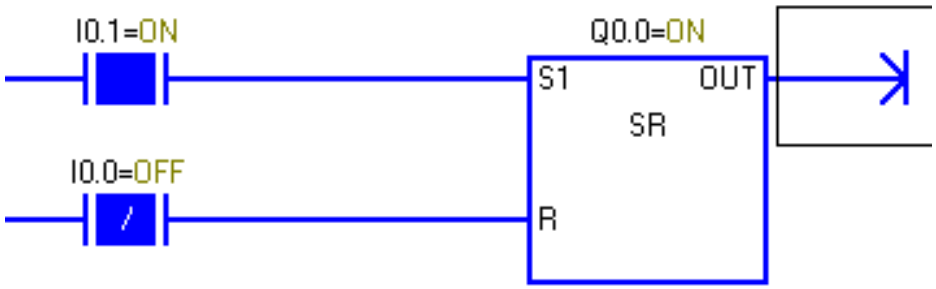
When button is pressed, it gives one pulse

- NEGATIVE transition:



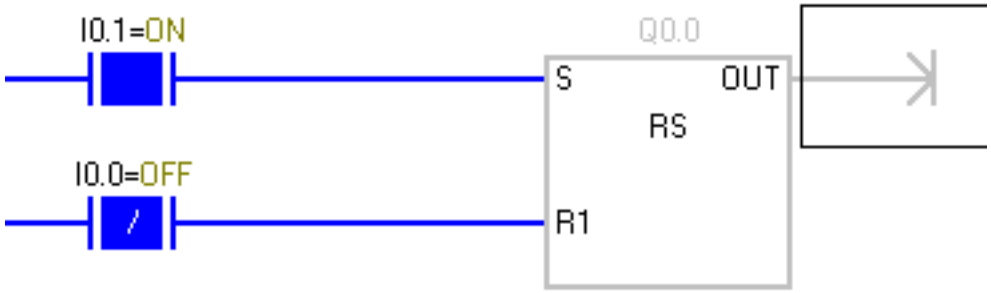
When button is released, it gives one pulse

SET RESET dominate bi stable:



When both buttons are pressed

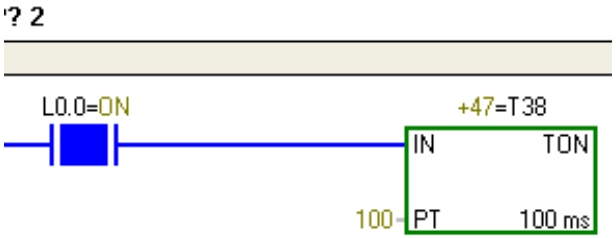
RESET SET dominate bi stable:



When both buttons are pressed

Timers:

ON delay timer

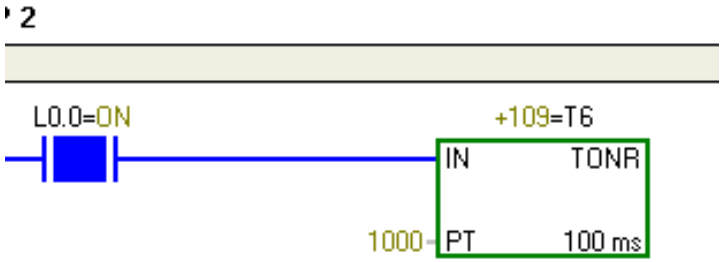


T38 is timer number, PT is preset timing value

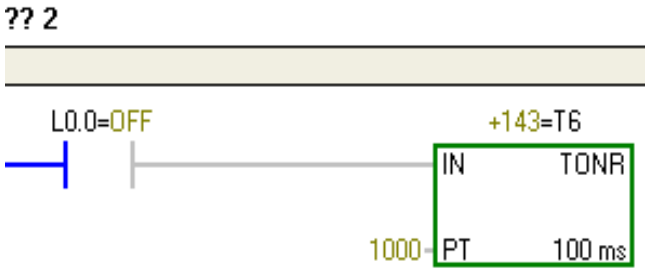
Timer Type	Resolution	Maximum Value	Timer Number
TONR	1 ms	32.767 s	T0, T64
	10 ms	327.67 s	T1-T4, T65-T68
	100 ms	3276.7 s	T5-T31, T69-T95
TON, TOF	1 ms	32.767 s	T32, T96
	10 ms	327.67 s	T33-T36, T97-T100
	100 ms	3276.7 s	T37-T63, T101-T255

OFF delay timer:

RETENTIVE timer:

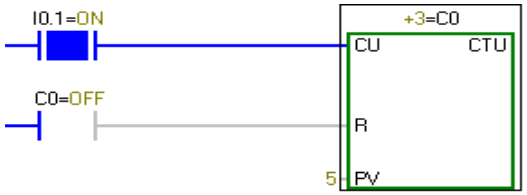


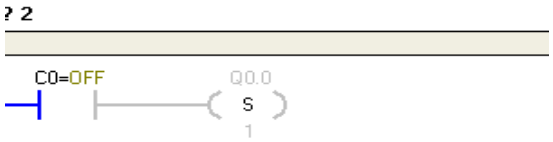
When PLC is on



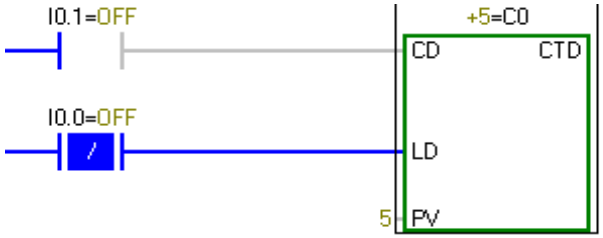
When PLC is stopped

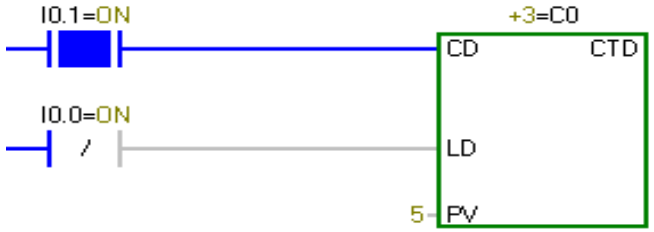
COUNTERS:

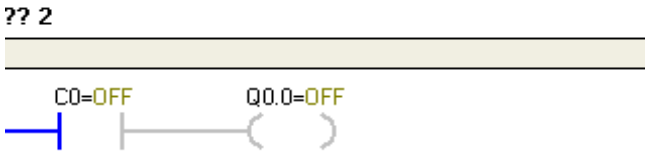




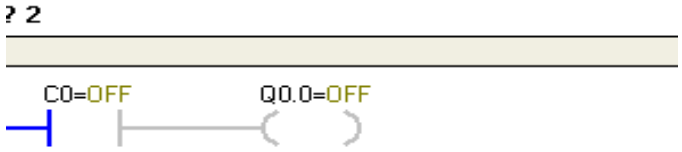
UP Counter





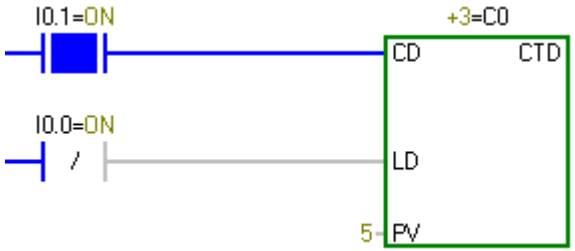


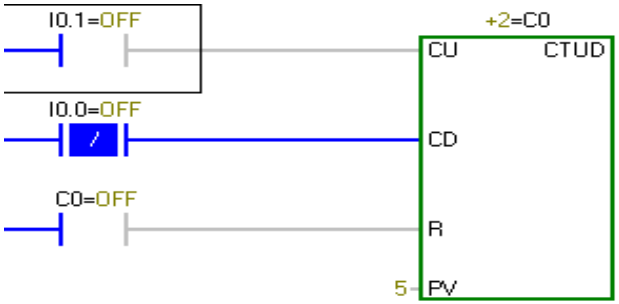
Down counter, loading contact



Down counter, counting reverse

UP-DOWN Counter:

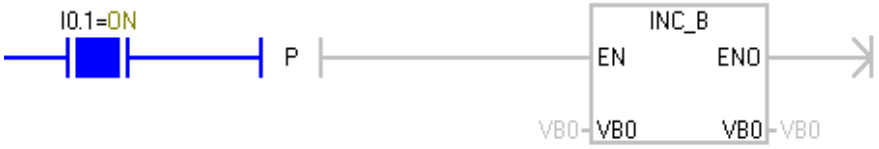




UP counter is active

DOWN counter is active

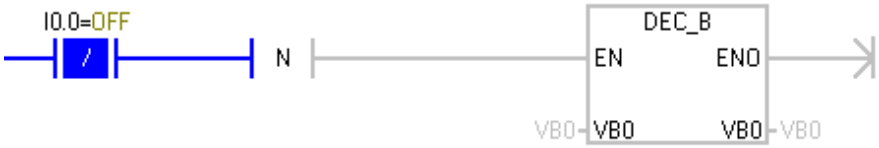
- INC/DEC command:



	??	??	
1	VB0	???	6
2		???	

Button is pressed

Data register is incremented

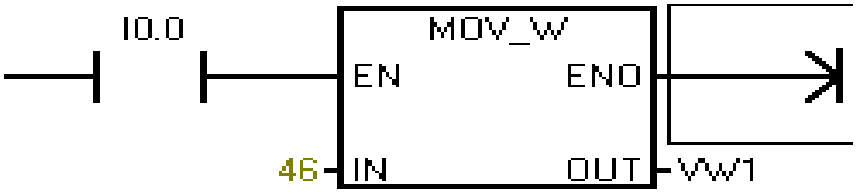


??	??	
VB0	???	3
	???	

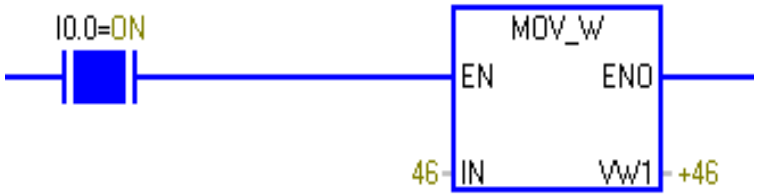
Button is pressed

Data register is decremented

- MOVE Command:



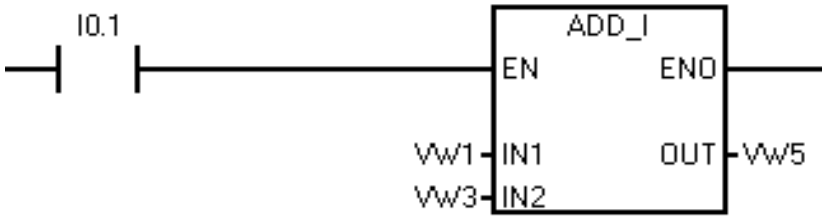
Before execution



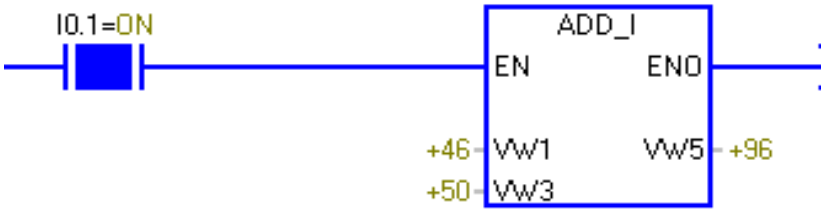
After execution

- ARITHMATIC Commands:

ADD



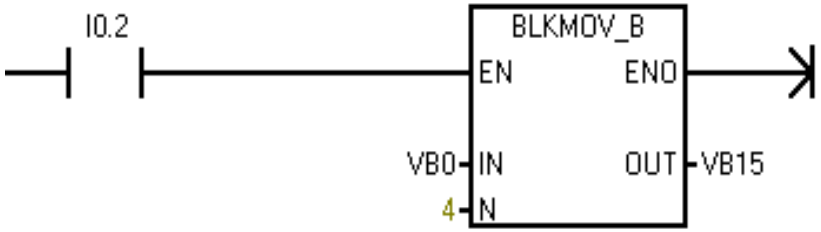
Before execution



After execution

Similarly for SUB, DIV and MUL.

- BLOCK MOVE command:

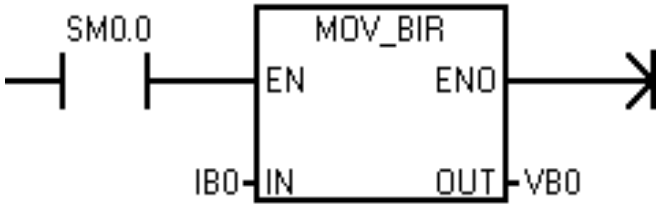


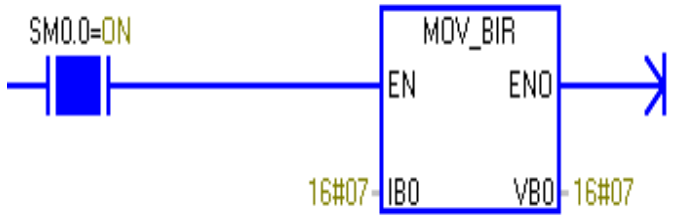
Before execution

VB0	???	5
VB1	???	10
VB2	???	15
VB3	???	20
VB15	???	5
VB16	???	10
VB17	???	15
VB18	???	20

After execution

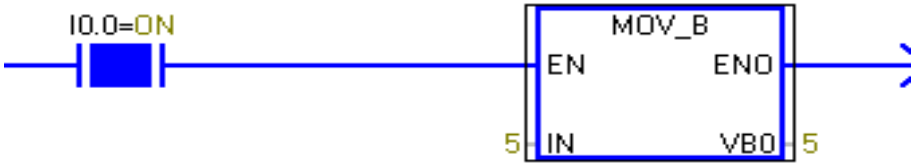
- MOVE byte immediate read:

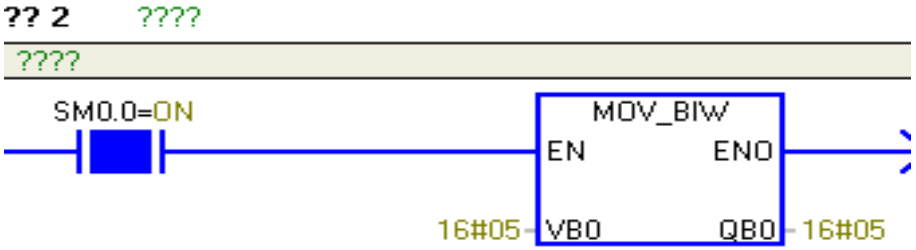




7 shows, 1st 2nd 3rd inputs are ON

- MOVE byte immediate write:

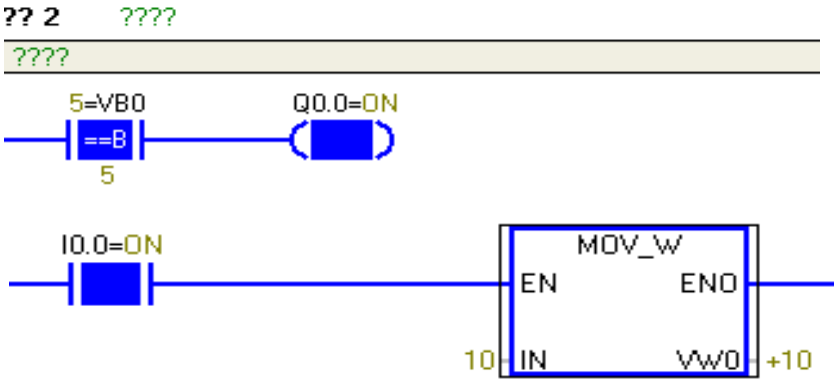


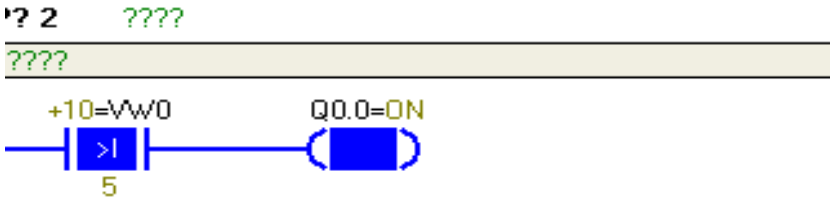


5 shows, 1st and 3rd outputs are ON

COMPARE instructions:

Equal to command

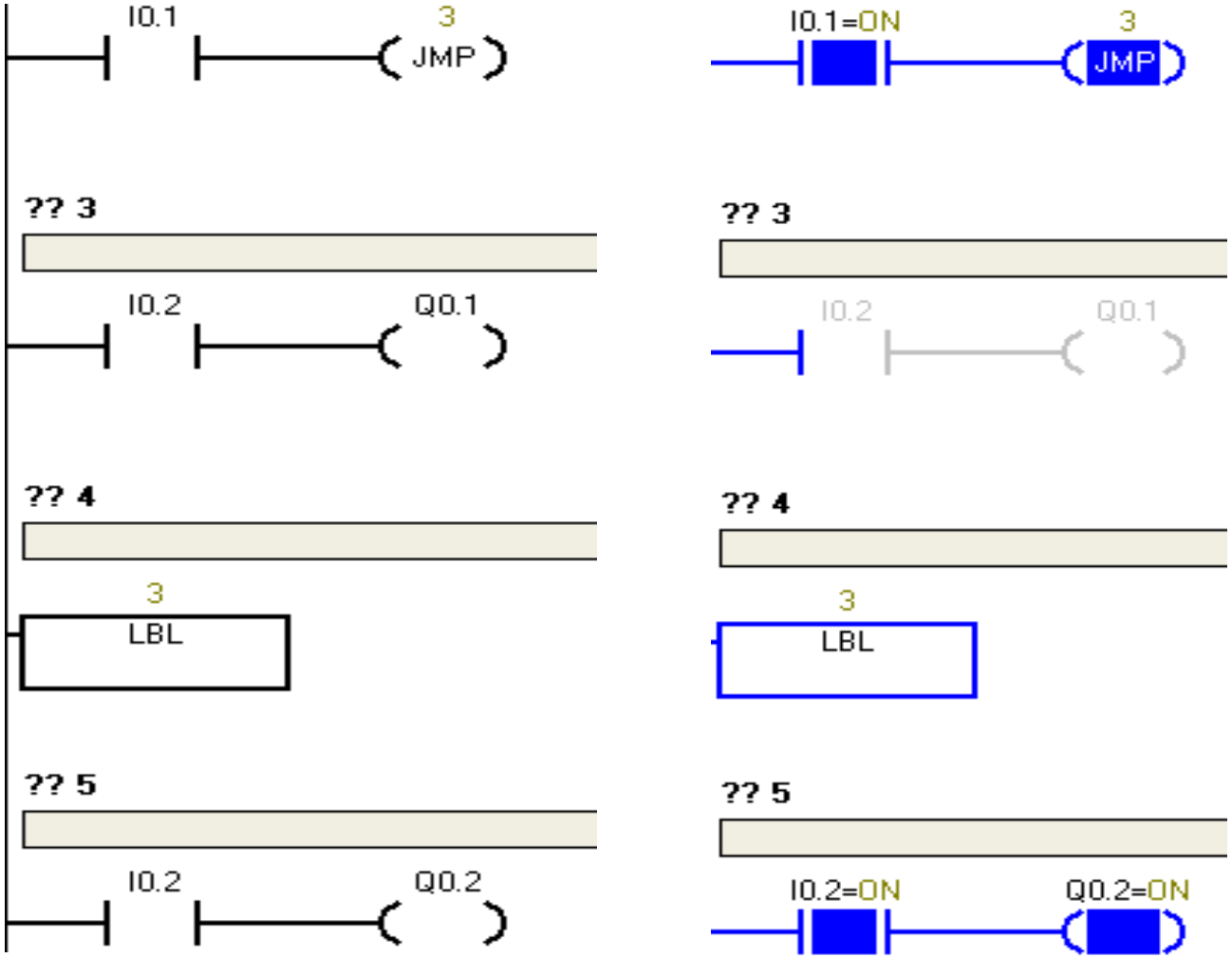




Greater than command

Similarly for Less than, Not equal to and Less or Greater than equal to.

- JUMP LABEL instruction:



Thanks

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